

Remarks

Miscellaneous Amendments

A minor amendment has been made to claim 23 namely, “dynamically substantially decoupled” has been amended to “substantially dynamically decoupled” solely for grammatical improvement and patentability to conform its terminology to that used elsewhere in the claims.

Claim 26 has been amended to depend from claim 25 rather than from claim 23 in order to provide clear antecedent basis for the recitation of “the structure dynamically decoupled from the optical assembly” in claim 27, which depends from claim 26.

Claim 27 has been amended by inserting the word “is” solely for grammatical correctness.

Claim 36 has been amended to include the word “A” at the beginning solely for grammatical correctness.

None of the amendments noted above were made to overcome any rejections or to distinguish over the prior art or for any other reason relating to patentability.

Withdrawal of Claim 33

In response to the restriction requirement, claim 33 was previously identified in error and without deceptive intent as drawn to elected Species 2. Claim 33 is drawn to non-elected Species 1 and has therefore been withdrawn without prejudice.

Rejections Under 35 U.S.C. §102(b)

Claims 23-36 have been rejected under 35 U.S.C. §102(b) as allegedly anticipated by Eurlings et al. ‘907.

The rejection of claim 33 has been rendered moot by its withdrawal without prejudice as being drawn to a non-elected species.

For the reasons set forth below, Applicants respectfully request reconsideration and withdrawal of the rejections of claims 23-32 and 34-36.

In order to anticipate a claim, each and every element as set forth in the claim must be found, either expressly or inherently disclosed in a single prior art reference. MPEP §2131, citing *Verdegal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2USPQ2d 1051 (Fed. Circ.1987). Further although the prior art reference need not use the identical terminology used in a claim in order to anticipate that claim, an anticipation rejection is not proper unless the elements in the prior art reference must be arranged as required by the claim. MPEP §2131 citing *In re Bond*, 910 F.2d 831, 15 USPQ2d 1566 (Fed. Cir.1990). Applicants respectfully submit that rejections of claims 23-32 and 34-36 are improper, and should be withdrawn, because the prior art relied upon by the Examiner namely, Eurlings et al. '907 does not satisfy those requirements, particularly in light of the amendments discussed below.

Claim 23 has been amended to recite, instead of an "optical assembly," an "optical apparatus" which, in addition to the "optical assembly" also affirmatively recites the "feeder device" as a component of the optical apparatus. Conforming amendments have been made to dependent claims 24-35. The former language "can be inserted" has been deleted in favor of language which cannot be interpreted as a mere intended use. In its present form, claim 23 now recites "said feeder device being operable to interchangeably insert into the beam path and to remove from the beam path at least one optical element of said plurality of optical elements." The recitation "the remaining

optical elements” has been clarified to read “the remaining ones of said plurality of optical elements.”

As to the rejection of claim 23, Applicants note that in Fig. 1, Eurlings et al. ‘907 shows a lithographic projection apparatus which includes an illuminator, designated as IL and a projection objective designated as PL. Fig. 2 of Eurlings et al. ‘907 is an illustration of a part of an illuminator which includes a beam path (22), and optical elements (10), (14), (18) and (20) located in the beam path (22). An optical element exchanger (12) forms part of the illuminator of Fig. 2 and is described as *“having access to other optical elements that can be substituted for optical element (10) in the beam path. The exchanger (12) may comprise any suitable means for inserting and removing optical elements from the beam path, such as a carousel or rotatable disc provided with several optical elements and controllable to position a selected one of the optical elements in the beam path, or a “slide-in-slide-out” mechanism, as employed in a photographic slide projector, for example.”* (Quoting Eurlings et al. ‘907 at col. 9 lines 16-24). However, there is nothing in Eurlings et al. ‘907 which supports the Examiner’s contention that Eurlings et al. ‘907 discloses or suggests optical element (10), or any other optical element accessible by exchanger (12) to be inserted into the beam path (22), “being substantially dynamically decoupled from the remaining ones of said plurality of elements of the optical assembly” as claim 23 in its present form expressly recites. Contrary to the assertion of the Examiner, there is no express or implied disclosure anywhere in Eurlings et al. ‘907, either in the col. 9 lines 18-24 passage cited by the Examiner or elsewhere of optical element (10) being substantially dynamically decoupled from any of the other disclosed optical elements of illuminator IL. Fig. 1 and Fig. 2 of

Eurlings et al. '907 cannot reasonably be construed as providing any disclosure of dynamic decoupling as recited in claim 23. Fig. 1 of Eurlings et al. '907 depicts illuminator IL as a single box, showing neither exchanger (12), optical element (10) nor any other optical elements. Fig. 2 of Eurlings et al. '907 is described at col. 7 lines 39-40 as "an illustration of *part* of an illuminator according to the present invention" (emphasis added) and thus cannot be relied upon as an illustration of its complete structure. No mounting details of exchanger (12), optical element (10) or other optical elements such as lens (14), coupling lens (18) or integrator rod (20) are shown. Fig. 2 shows exchanger (12) and optical element (10) but neither Fig. 2 nor any other part of Eurlings et al. '907 provides any structural details or other information which could reasonably be interpreted as disclosing or even inferring that optical element (10), or any other optical element accessible to exchanger (12), is "substantially dynamically decoupled from the remaining ones of said plurality of optical elements of the optical assembly" as claim 23 expressly recites. If anything, Eurlings et al. '907 teaches away from such dynamic decoupling.

Fig. 1 represents illuminator IL as a single, unitary box and the reference is devoid of any notation, text or other indication indicating that optical element (10) of the IL shown in Fig. 2 should be "substantially dynamically decoupled" from any of the other optical elements thereof. Because of Fig. 1 and its characterization in the Brief Description of the Drawings, a person of ordinary skill would interpret all of the components of Fig. 2 of Eurlings et al. '907 as being included in a unitary structure consistent with the single box labeled "IL" in Fig. 1. In no event, however, can Eurlings et al. '907 be reasonably construed to expressly or impliedly disclose, teach or suggest, either alone or in combination with any other prior art of record or other knowledge

within the purview of a person of ordinary skill in the art at the time Applicants' invention was made, or for any other reason make obvious to such person, an optical assembly as otherwise recited in claim 23 wherein the "feeder device" is "operable to interchangeably insert into the beam path and to remove from the beam path at least one optical element of said plurality of optical elements, with said at least one optical element being substantially dynamically decoupled from the remaining ones of said plurality of optical elements of the optical assembly." Therefore, claim 23 is respectfully submitted to be patentable in its present form.

Claims 24 through 32 and 34-36 are each respectfully submitted to be patentable over the prior art of record for at least the same reasons as those noted above regarding claim 23 since each one of those depends either directly or indirectly from claim 23.

Claim 24 is also respectfully submitted to be patentable on grounds independent and distinct from claim 23. Claim 24 has been amended to expressly recite a "housing" and to remove the former "can be..." recitation in favor of an affirmative recitation of insertion and removal of the "at least one optical element by way of said opening."

Contrary to the assertion of the Examiner, Applicant respectfully submits that neither Fig. 1 nor col. 9 lines 13-17 on which the Examiner relies, nor any other part(s) of Eurlings et al. '907, expressly or impliedly disclose or for any other reason would have made obvious a person of ordinary skill in the art at the time Applicants' invention was made, an optical apparatus as otherwise recited in claim 23 wherein the optical assembly has a housing provided with "an opening adapted to the dimensions of said at least one optical element, said at least one optical element being inserted into the beam path and removed from the beam path by way of said opening" as claim 24 recites. As pointed out

above, taken together, Figs. 1 and 2 of Eurlings et al. '907 suggest that all the components shown in Fig. 2, including without limitation exchanger (12) and optical element (10) are disposed inside one and the same box as illustrated in Fig. 1. In the alternative embodiment of the illuminator IL shown in Fig. 7 of Eurlings et al. '907 and described at col. 13 lines 15-45, two optical elements (10A), (10B) are disposed in series along the beam path and are each coupled to a respective exchanger (12A), (12B). Since the exchanger (12) as well as the optical elements (10) to be inserted into and removed from the beam path are located within the box IL of Fig. 1, Eurlings et al. '907 cannot reasonably be construed as suggesting that an apparatus as recited in claim 24 where insertion of the optical element into the beam path and removal thereof from the beam path are carried out by way of an opening in the housing.

Claim 25 is also submitted to be patentable on grounds independent and distinct from claim 23 because, contrary to the position taken by the Examiner, there is no disclosure in Eurlings et al. '907 of an optical assembly as otherwise recited in claim 23 "wherein the feeder device is dynamically decoupled from the optical assembly and is connected to a structure which dynamically decoupled from the optical assembly" as recited in claim 25. Applicants' Fig. 3 is an embodiment of such an optical assembly in which reference numeral (19) corresponds to the recited "structure." As pointed out above, the unitary box used to represent the entire illuminator "IL" in Fig. 1 of Eurlings et al. undercuts the assertion that Eurlings et al. '907 discloses or suggests that the exchanger (12) suggests that the exchanger (12) of Eurlings et al. '907 is somehow dynamically decoupled from the optical assembly much less that it is connected to a structure that is dynamically decoupled from the optical assembly as claim 25 recites.

In addition to the amendments already noted, claim 26 has been amended to affirmatively recite the “lifting device” as an element of the claimed apparatus and the former language “...can be positioned...” has been removed in favor of an affirmative recitation of “said at least one optical element being positioned....” Claims 26 and 27 in their present form are both patentable over the prior art of record for at least the reasons noted above regarding claim 23 from which they both depend indirectly. Claim 26 is further submitted to be patentable on independent and distinct grounds because claim 26 now recites a “lifting device” and that “at least one optical element can be positioned and/or fixed in the beam path via said lifting device.” It must be noted that the “lifting device” is included in the claimed combination of claim 26 in addition to the “feeder device” recited in claim 23. In paragraphs 1 and 3 on page 3 of the Office Action, the Examiner alleges that the exchanger (12) of Eurlings et al. ‘907 meets Applicants’ recitation of a “feeder device” but in rejecting claim 26 makes the inconsistent assertion that the exchanger (12) corresponds to Applicants’ “lifting device.” The exchanger (12) of Eurlings et al. ‘907 does not meet Applicants’ claim 26 which recites two devices, namely, a “feeder device” and a “lifting device.” Eurlings et al. ‘907 is devoid of any support for construing its exchanger (12) to be a “lifting device” within the meaning of claim 26. First, there is no express or implied disclosure in Eurlings et al. ‘907 that exchanger (12) thereof inserts optical element (10), or any other optical element, into the beam path, or removes same from the beam path, by lifting. Absent a disclosure of lifting, the exchanger (12) of Eurlings et al. ‘907 cannot properly be construed to be a “lifting device.”

Further, as stated in the passage of Eurlings et al. '907 at col. 9 lines 18-24 cited by the Examiner, the exchanger (12) not only inserts and removes the optical elements from the beam path but is also said to be "controllable to position a selected one of the optical elements in the beam path." Since the optical element (10) of Eurlings et al. '907 is positioned in the beam path by exchanger (12) a person of ordinary skill in the art would find no need to provide any additional device, much less in particular a "lifting device," to fulfill a function already performed by exchanger (12). Thus, Eurlings et al. '907 neither discloses nor provides any impetus that might have motivated a person of ordinary skill in the art at the time Applicants' invention was made to provide, in addition to a feeder device for inserting an optical element into the beam path and removing that optical element from the beam path, a lifting device for positioning and/or fixing that optical element in the beam path as claim 26 recites. Further, as noted above in connection with claim 23, the prior art of record, including without limitation Eurlings et al. '907 is devoid of any disclosure or suggestion of an optical assembly as otherwise recited in claim 26 wherein the optical element that is inserted into and removed from the beam path by the recited feeder device being one which is "substantially dynamically decoupled" from the remaining ones of the plurality of optical elements of the optical assembly.

Claim 27 is patentable for at least the same reasons noted above regarding claims 23 and 26 from which claim 27 depends. Claim 27 is also submitted to be patentable on independent and distinct grounds owing to its recitation of the "lifting device" being "dynamically decoupled from the optical assembly and connected to the structure dynamically decoupled from the optical assembly." The contention of the Examiner to

the contrary is inconsistent with Figs. 1 and 2 of Eurlings et al. '907 which taken together suggest that all the elements of the illuminator shown in Fig. 2 are part of one structure, namely the box labeled "IL" in Fig. 1.

Claim 28 has been amended to affirmatively recite a "holding device" as an element of the claimed apparatus and to expressly recite that the holding device "serves as a stop and/or for fixing said at least one optical element in the beam path."

Claim 28 in its present form is submitted to be patentable for at least the reasons noted above regarding claim 23 from which claim 28 depends. Claim 28 in its present form is also respectfully submitted to be patentable on independent and distinct grounds owing to its affirmative recitation of a "holding device" which "serves as a stop and/or for fixing said at least one optical element in the beam path." The Examiner argues that "[i]t is inherent that the lens would be held by a holding means, this being based upon the lens being maintained at a particular position to receive the beam." The fallacy of this argument is that according to the express teaching of Eurlings et al. '907 at col. 9 lines 18-24, the exchanger (12) which the Examiner inconsistently contends meets both to Applicants' recited "feeder device" and Applicants' separately recited "lifting device," "is controllable to position a selected one of the optical elements in the beam path." Since the exchanger (12) is explicitly disclosed as carrying out the function of positioning the optical element to receive the beam, the invocation of an undisclosed but allegedly inherent additional device, namely a "holding device," to perform that same function cannot be reconciled with the express teaching of Eurlings et al. '907.

For the same reason that Eurlings et al. '907 cannot be construed as inherently disclosing a holding device as recited in claim 28, it demonstrates the non-obvious nature of same. A person of ordinary skill in the art would not have found it obvious to modify the apparatus of Eurlings et al. '907 by adding Applicants' recited holding device thereto because doing so would have been viewed as unnecessary in light of the functionality explicitly already provided by exchanger (12).

Claims 29 and 30 each depend from claim 28 and base claim 23 and are thus patentable over the art of record for at least the reasons pointed out above concerning claims 29 and 30.

Claim 29 has been amended to conform to the language used in claims 23 and 28 as amended. The Office Action does not explain where Eurlings et al. '907 discloses the feature of the holding device being connected to one of the remaining optical elements nor does it even expressly allege that such disclosure exists. Applicants have been unable to identify any such teaching or disclosure in Eurlings et al. '907 and respectfully submit that the recited structure is not disclosed or rendered obvious by any of the prior art of record.

Claim 30 is also submitted to be patentable on independent and distinct grounds in view of the amendments to claim 30 presented herein. Claim 30 now recites that "at least one optical element is fixed in the beam path by said holding device using magnetic forces." Support for the amendments can be found in the application as originally filed at for example, the first full paragraph on page 10 of the Specification. Since, for the reasons noted above regarding claim 28, an optical assembly as otherwise recited in claim 23 wherein "a holding device is provided as a stop and/or for fixing the dynamically

decoupled element in the beam path” as recited in claim 28 is neither disclosed nor rendered obvious in view of the prior art of record, the prior art of record cannot reasonably be construed as disclosing or rendering obvious such recited apparatus wherein the recited “said at least one optical element is fixed in the beam path by said holding device using magnetic forces” as claim 28 in its present form recites. Neither in the blanket rejection of claims 28-30 on page 4 nor elsewhere in the Office Action does the Examiner identify any alleged disclosure in Eurlings et al. ‘907 of an apparatus as otherwise recited in claim 30 which includes holder which uses magnetic forces to stop or fix an optical element in the beam path.

As to claim 31, it is respectfully submitted that the vague “any suitable means” passage at col. 9 lines 18-24 of Eurlings et al. ‘907 cannot be construed as disclosing or rendering obvious the structure claimed with particularity in claim 26 because the “disclosure” relied upon is insufficient to enable a person of ordinary skill in the art to make and use the apparatus as claimed in claim 31.

The patentability of claim 32 also does not rely on the patentability of claim 23 or intervening claims 25, 26 and 32. Whereas claim 32 recites “the feeder device and/or said lifting device are arranged outside the optical assembly” the exchanger (12) of Eurlings et al. ‘907 which the Examiner attempts to analogize to both the “feeder device” and the “lifting device” of Applicants, is taught by Figs. 1 and 2 of Eurlings et al. ‘907 as being inside the same box “IL” as the optical elements (14), (18) and (20) also present in Fig. 2. Accordingly, Eurlings et al. ‘907 cannot be properly construed as disclosing or rendering obvious the apparatus of claim 32

As to claim 34, the “rotatable disc” in the passage cited by the Examiner is not a “rotatable disc diaphragm” because it does not consist of or include a diaphragm. As explained at col. 9 lines 49 and 50 of Eurlings et al. ‘907. “[T]he optical element (10) is generally a thin element, such as an array of microlenses or a DOE.” At col. 4 lines 48-58 Eurlings et al. ‘907 expressly defines the term “optical element” as used in that patent in a way which does not encompass a diaphragm:

“The term “optical element as employed here should be interpreted as referring to elements such as a diffractive optical element (e.g., comprising an array of microlenses), referred to hereafter as “DOE,” a microlens array, a holographic optical element (e.g., comprising an array of computer generated holographic optical subelements, etc.) Further information on DOEs is given for example in U.S. Patent No. 5,850,300... Said elements are generally relatively thin and can be made for example on a substantially plane – parallel substrate.”

In view of this express teaching, Eurlings et al. ‘907 neither discloses nor renders obvious the inclusion of “a rotatable disc diaphragm” in the apparatus claimed in claim 34.

Claims 35 and 36 have been amended to conform to the preamble of amended claim 23. Claims 35 and 36 are submitted to be allowable in their present form for at least the same reasons pointed above as to claim 23.

Conclusion

In view of the foregoing, it is believed that all the objections and rejections of record have been overcome and that claims 23-32 and 34-36 are patentable over the prior art of record and are in condition for allowance in their present form

Respectfully submitted,

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